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January 7, 1991

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Federal Communications Commission
Office of the Secretary

ORIGINAL
FILE

Mrs. Donna Searcy
Secretary
Federal Communications Commission
1919 M Street, N.W.
Room 222
Washington, D.C. 20554

Re: Petition of Norris Satellite Communications, Inc. Requesting Amendment of Parts 2 and 25 of the Commission's Rules to Establish a General Satellite Service in the Ka-band (20/30 GHz), RM No-7511

Dear Ms. Searcy:

Attached are an original and four copies of the reply comments of Norris Satellite Communications, Inc with regard to the above-referenced petition for rulemaking.

Please contact the undersigned if you have any questions concerning this matter.

Sincerely yours,


Leslie A. Taylor

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JAN - 8 1991

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

Federal Communications Commission
Office of the Secretary

In the Matter of the Petition of

Norris Satellite Communications, Inc.

Requesting Amendment of Parts 2
and 25 of the Commission's Rules
to Establish a General Satellite
Service in the Ka-band (30/20 GHz)

RM No-7511

Reply Comments of Norris Satellite Communications, Inc.

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January 7, 1991

Reply Comments of Norris Satellite Communications, Inc.

Table of Contents

EXECUTIVE SUMMARY	ii
I. Introduction	1
II. GMC and AMSC Do Not Oppose the Creation of a Generic Satellite Service	2
III. Spacenet's Arguments are Based on Incorrect Technical Assumptions ..	4
IV. A General Satellite Service Would Most Flexibly Address Future Satellite Requirements	7
V. Norris is a Pioneer in Developing the 20/30 GHz Band and Should Be Accorded a Pioneer's Preference	8
VI. A General Satellite Service Will Best Promote Development and Use of the 20/30 GHz Band	10
VII. Conclusion	12

EXECUTIVE SUMMARY

Reallocation of a portion of the 20/30 GHz band to a General Satellite Service would best promote development and use of this frequency band currently unused in the United States. Creating a flexible frequency allocation recognizes the artificiality and limitations of service distinctions and would promote implementation of service, and service and equipment innovation.

Geostar Messaging Corporation (GMC) and the American Mobile Satellite Corporation (AMSC), while commenting on the rulemaking, do not oppose the creation of a General Satellite Service. GMC asks for a technical analysis of General Satellite Service compatibility with its proposed feederlink operations in the band. Norris believes that the rulemaking and its application should not be deferred pending such analysis and that coordination with GMC's operations is feasible should the Commission permit the digital land mobile satellite service feederlinks or other operations to utilize 20/30 GHz frequencies. Norris agrees with AMSC that a generic satellite service in the 20/30 GHz band does not diminish the need for additional L-band allocations for mobile satellite service.

Norris believes that the comments filed by GTE Spacenet Corporation are founded on several technical misunderstandings. Close orbital spacing is technically feasible at 20/30 GHz, and both fixed-satellite and point-to-multipoint operations are likely to be homogeneous in e.i.r.p. Mobile operations are likely to use spread spectrum, resulting in substantial orbit reuse.

The 12 GHz DBS spacing of nine degrees has no bearing on spacing in the 20/30 GHz band because that spacing is limited to that frequency band and is based on the outcome of an international conference rather than on technical necessity. Higher elevation angles are required at Ka-band, reducing somewhat the amount of orbital arc from which all 50 states can be served, but this limitation is independent of the service definitions applied to the frequency band.

Creating a General Satellite Service is consistent with the Commission's movement toward generic frequency allocations, best preserves options for the future, and is consistent with United States input into preparations for the 1992 World Administrative Radio Conference.

I. Introduction

Norris Satellite Communications, Inc. (Norris) hereby respectfully submits its Reply Comments in the rulemaking which it has initiated to amend the Commission's rules to establish a General Satellite Service in a portion of the 20/30 GHz frequency band. Norris has requested this reallocation to permit operation of fixed, mobile and point-to-multipoint service within the same frequency band and from the same spacecraft. Norris also has pending an application for construction of two and launch and operation of one satellite to provide these services in the 20/30 GHz band. Within the context of its Petition for Rulemaking, Norris has asked that the Commission confer a Pioneer's Preference on its authorization to provide satellite service in the Ka-band, in recognition of its pioneer service in a new frequency by band, and provision of new satellite services in the United States.

GTE Spacenet Corporation ("Spacenet") filed comments in this rulemaking asking that the Commission not reallocate portions of the 20/30 GHz band as Norris has requested. Spacenet argues that a General Satellite Service in these band "would constitute an inefficient use of orbital locations and spectrum."¹ GTE Spacenet states that wide orbital spacing would be required in the 20/30 GHz band, reducing the number of usable orbital locations to one or two for the entire United States. Spacenet claims that the fixed-satellite service (FSS) requires the frequencies proposed for reallocation because of growth in demand for services provided by satellites operating in the FSS, and that additional frequencies are not needed for mobile satellite service and point-to-

¹ Comments of GTE Spacenet Corporation, page 2.

multipoint satellite service. Spacenet also argues that Norris is not entitled to a Pioneer's Preference because Norris is not proposing to provide any "new" service.

Geostar Messaging Corporation (GMC) and the American Mobile Satellite Corporation (AMSC) also filed comments in this rulemaking raising concerns with regard to the use of the 20/30 GHz bands for mobile satellite service.

II. GMC and AMSC Do Not Oppose the Creation of a Generic Satellite Service

In its comments GMC supports the notion of a generic satellite service at Ka-band.

GMC states:

as a general principle...(it) supports the concept of permitting space stations licensed in one radiocommunication service to provide other types of radiocommunication services, even if the bands are not allocated to such radiocommunications services, as long (as) the additional services do not cause any more interference than the levels permitted in the original system authorization...Thus, GMC believes that the concept of a General Satellite Service may offer substantial flexibility to satellite system operators in the 30/20 GHz bands to respond quickly to changing technological and market conditions. GMC comments, page 2.

Nevertheless, GMC asks that reallocation of the 30/20 GHz band to a General Satellite Service be delayed until "a detailed technical analysis...be performed to analyze the potential impact that such a new service could have on more conventional fixed satellite uses of the bands, such as feeder links." GMC comments, page 3. GMC, in its application to establish a domestic mobile satellite system proposes to utilize portions of the 30/20 GHz bands for its feederlinks and its telemetry, tracking and command operations.

In GMC's application, it states:

With respect to orbital spacing between satellites operating in the 20/30 GHz bands, GMC does not believe it is necessary for the Commission to establish an orbital spacing policy in these bands simply to authorize the GMC DLMSS satellite system. The GMC satellites use only a few MHz of the 500 MHz of spectrum in the 19.7-20.2 and 29.5-30.0 GHz bands and thus will have little effect on subsequent users. Since there is currently no use being made of these bands, GMC believes that this question can be deferred to a later date when there are more concrete plans for the use of this band by the fixed satellite service.²

Norris takes no position at this time as to whether GMC's requirement for feederlinks can best be met in the 20/30 GHz band or in some other frequency band. However, if the Commission should determine that these feeder links will be provided in the 20/30 GHz band, Norris submits that action on its application or this rulemaking should not be delayed in order to conduct the analysis requested by GMC. Use by the band for a primary service should not be impeded because of some potential use for feederlinks. Norris will commit to coordinate with GMC or other licensees of satellite services which the Commission may authorize to use the 20/30 GHz in some manner.³

AMSC's concerns focus solely on the possible impact Norris' rulemaking petition may have on the Commission's perceptions as to the need for additional allocations in the L-band for Land Mobile Satellite Service (LMSS). Norris agrees with AMSC that additional frequency allocations are needed in the L-band for LMSS. Moreover, Norris

² GMC application, I-4.

³ See, Motorola Satellite Communications, Inc., Application for Authority to Construct, Launch and Operate a Low Earth Orbit Satellite System in the 1610-1626.5 MHz band, filed December 3, 1990. Motorola proposes, in its application, to use a portion of the 20/30 GHz band for inter-satellite service links for its system. Coordination between such a service and geostationary satellite service would likely be required.

agrees with AMSC that there is substantial demand for LMSS and that demand will require additional L-band allocations. Norris proposes the creation of a General Satellite Service at Ka-band to address the eventual needs for additional bands for mobile satellite. As stated in the Norris application, the use of Ka-band for mobile service will be studied in the course of the ACTS experiment and the extent to which the Norris system will be used for mobile service is not yet known.

III. Spacenet's Arguments are Based on Incorrect Technical Assumptions

Spacenet bases its claims that creation of a General Satellite Service at 20/30 GHz will drastically reduce spectrum/orbit efficiency on several assumptions. Spacenet's assumptions are: (1) nine-degree orbital spacing will be required pursuant to the 1983 Broadcasting Satellite Service plan; (2) power inhomogeneity will exist between spacecraft capacity used for fixed-satellite service and that used for point-to-multipoint satellite service; and (3) requirements for 50-state coverage will reduce the number of suitable orbital locations at Ka-band.

Norris believes that Spacenet has based its concerns about spectrum/orbit efficiency in the 20/30 GHz band on a number of faulty assumptions. First of all, as Norris has explained in its Opposition to Spacenet's Petition to Deny its application, the nine-degree orbital spacing in the 1983 Broadcasting Satellite Service plan is a result of the need to develop a spectrum/orbit plan which satisfied the stated requirements of all the administrations. Use of various assumed satellite and earth station technical characteristics and assumed interference protection levels resulted in a plan with nine-

degree spacing between orbital assignments for a single administration. The Commission has never made a finding that nine-degree spacing is required for operation in the Direct Broadcast Satellite (DBS) service.

Moreover, the 1983 Region 2 Broadcasting Satellite plan applies only to the frequency bands 12.2-12.7 GHz. Those bands were specified for planning at the conference to resolve political concerns about access to the geostationary orbital arc. In view of the United States' belief that planning the use of the spectrum/orbit resource reduces, rather than enhances, the use of that resource, it is virtually unthinkable that nine-degree spacing would be applied to the 20/30 GHz band.

Furthermore, as discussed in the Norris Opposition, as well as in the Reply Comments filed today by the National Aeronautics and Space Administration, close orbital spacing in the 20/30 GHz satellite band is quite feasible. While Norris suggests that it is not necessary or wise to specify orbital spacings in advance of any operational satellites in the 20/30 GHz band in the United States, Norris is confident that it can demonstrate that close orbital spacing would be possible, even with provision of both fixed-satellite and point-to-multipoint satellite service.

Spacenet assumes that a disparity will exist between power levels for service for fixed-satellite service and point-to-multipoint applications. This assumption, while it may be correct with regard to existing satellite operations, will not be borne out in future generations of spacecraft. As NASA points out, "the historical trend toward higher power fixed satellites will continue. Combined with the projected use of satellite spot beams, Ka

band satellites will likely be quite homogeneous in e.i.r.p."⁴ NASA also believes, and Norris concurs, that "earth station antenna gains are also expected to migrate toward a common value at Ka-band regardless of the intended application."⁵ Because of the need to overcome the effects of rain attenuation, spot beams are likely to be used, along with higher power.

With regard to the effect of mobile satellite service on inhomogeneity, use of spread spectrum "would accommodate orbit reuse by closely spaced satellites."⁶ NASA is planning a number of mobile satellite and personal access satellite experiments with ACTS in order to gain additional information on the operating characteristics at 20/30 GHz for such services.

As NASA points out, Spacenet's analogy of the Commission's policy with regard to separations between the FSS and DBS bands at 12 GHz is not applicable to the 20/30 GHz band. At the time these policies were developed, there was substantial difference between e.i.r.p. for the two services, which necessitated different orbital spacing. In addition, the policy reasons that led to the Commission's implementation of the DBS service have provided a rationale for maintaining distinctions in the regulatory schemes for the two services.

While Spacenet is correct that higher elevation angles will be required at Ka-band than at lower frequencies, and thus there may be a reduction in the orbital arc from which

⁴ NASA Reply Comments, page 4.

⁵ Supra. at page 4.

⁶ Supra., at page 5.

50 states can be served, this argument provides no basis for not creating a generic General Satellite Service. This reduction in arc for 50-state coverage exists regardless of service definition for the frequency band.

IV. A General Satellite Service Would Most Flexibly Address Future Satellite Requirements

Spacenet expresses concern that a General Satellite Service "would reduce the availability of spectrum for a service where there is increased demand--FSS, and would increase the availability of spectrum for services for which there is little current demand--DBS and MSS."⁷ Norris agrees with Spacenet that there is likely to be continued increase in demand for fixed-satellite services.

However, as to the future direction of satellite requirements, Norris believes that these are more likely to be in the area of point-to-multipoint applications (such as VSAT networks and direct broadcast applications) and mobile services. The reason for this belief is that fixed services will, over time, migrate to fiber optics, where economically feasible. As Spacenet points out, the use of fixed-satellite service has evolved substantially over the past 10 years. For example, while long distance telephony was a significant user of domestic satellite service 10 years ago, today virtual no telephony is carrier on U.S. domestic satellites (with the exception of some telephony to Hawaii). Even in the international environment, high capacity fiber optic cables are being installed in every practicable route.

⁷ Spacenet comments, p. 8.

Norris believes that these trends call for flexibility in defining the services to be provided in currently unused frequency bands, such as the 20/30 GHz band. Creation of a General Satellite Service will provide the Commission, and the industry, with an environment in which the band can be most productively used to address the requirements that are identified as systems are implemented.

As Norris stated in its Opposition to Spacenet's Petition to Deny its application, it is premature to assert, as Spacenet does, that DBS will not come to fruition, or that Mobile Satellite Service and DBS will not require substantial frequencies over the next 10, 15 or 20 years.

V. Norris is a Pioneer in Developing the 20/30 GHz Band and Should Be Accorded a Pioneer's Preference

Despite Spacenet's argument that Norris will be providing "nothing new" in the the 20/30 GHz band, Norris is confident that the Commission recognizes that the first provider of service in an unused frequency band is a true pioneer. Moreover, in the 20/30 GHz band, Norris will be providing satellite service that will move massive amounts of data at gigabit rates. Current 4/6 GHz and 12/14 GHz satellites are constrained to data rates in the megabit range. Such high data rate service will enable high-speed communication between supercomputers, increasingly used by the government, universities and the private sector. At present these supercomputers are limited in their capabilities by severe constraints on their ability to link up with other supercomputers.

Norris submits that the provision of this high data-rate service alone is "more than a minor variation of an existing service."⁸ In fact, such service is precisely what the Commission is talking about in its Pioneer Preference proceeding where it states that the preference will apply "to those novel services that address public needs that are being addressed inadequately."⁹

In addition to providing new, high-speed data service, Norris will be providing broadcast service to extremely small terminals, on the order of .75 meters in diameter. These broadcast services can utilize new video compression techniques, to produce large numbers of additional video channels.

As for mobile services, depending upon the outcome of ACTS experiments, Norris plans to implement new mobile, personal access satellite communications services. Such services are not provided on satellites now in operation.

Norris is a pioneer. Norris acknowledges that it is not the first company to file an application to provide satellite service in the 20/30 GHz band. Contel ASC and Hughes filed applications for such service in the 1980s. However, neither company pursued its application. Norris believes that the time is now right for implementation of such service and it is willing to take the risk to go forward in this frequency band.

Norris' proposal falls squarely within the proposed definition of pioneers contained in the comments of GTE Service Corporation, Spacenet's parent company, in the Pioneer Preference proceeding. GTE Service Corporation urges that such a preference

⁸ 5 FCC Rcd at 2767.

⁹ Id.

be available only to those companies that "put at risk their energies, capital and know-how in order to experiment with and develop new services."¹⁰ The risk Norris faces is significant. Terminals are not manufactured in bulk in the 20/30 GHz band. There is no installed base of such terminals. Users of satellite service have 4/6 GHz and 12/14 GHz earth stations and are comfortable with such service. The operational environment at 20/30 GHz is not yet fully known. The propagation effects are great. Few satellites have been manufactured for operation at Ka-band.

As GTE Service Corporation puts it, being a risk-taker is being a pioneer. And being a risk-taker to provide new service to the public is precisely what the Commission is seeking to encourage with its Pioneer Preference. Norris has confidence that the Commission will find that it is such a pioneer.

VI. A General Satellite Service Will Best Promote Development and Use of the 20/30 GHz Band

NASA stated in its Reply Comments in this proceeding, "As technology evolves toward digital satellite communications and earth stations become increasingly smaller, allocations based on current satellite service (are) artificial."¹¹

NASA goes on to express the view that such artificial distinctions between services may retard development of new frequency bands such as the Ka-band.

¹⁰ See, comments of GTE Service Corporation in Gen. Docket No. 90-217, filed June 29, 1990.

¹¹ NASA Reply Comments, p. 2.

Creating a broad definitional environment in the 20/30 GHz band would further several important objectives. First, creating such an allocation in the 20/30 GHz band would permit that band to be utilized for the services which will require spectrum to accommodate growth during the next decade and beyond. Second, the possibility of offering several services in a single band and from the same spacecraft would enable satellite operators the option of providing a mix of fixed, mobile, aeronautical, maritime and point-to-point services now available only through access to several satellites operating in different frequency bands. Finally, a generic approach would acknowledge and encourage the trend toward development of multi-purpose user terminals and enable satellites to be full participants in the evolution of a integrated services digital environment.

The Commission, in recent years, has moved towards "generic" spectrum allocations as a way "to be more responsive to the actual demands of the services as they develop."¹² With regard to mobile satellite service allocations, the Commission determined that "aeronautical, maritime and land-mobile satellite services were all to be grouped together and share spectrum on an equal footing."¹³

Norris notes that the FCC's Industry Advisory Committee for the 1992 World Administrative Radio Conference recommends that the United States develop a proposal

¹² Amendment of Parts 2, 22 and 25 of the Commission's Rules to Allocate Spectrum for, and to Establish Other Rules and Policies pertaining to the Use of Radio Frequencies in a Mobile Satellite Service for the Provision of Various Common Carrier Services, GEN Docket No. 84-1234, Memorandum Opinion and Order, 2 FCC Rcd. 6016, 6018 (1989) (MSS Generic Allocation Order).

¹³ See, Preparation for an International Telecommunication Union World Administrative Radio Conference for the Mobile Services, GEN Docket No. 84-607, Report and Order, 2 FCC Rcd. 821 (1987).

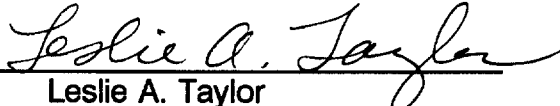
supporting developing of a definition for a General Satellite Service. The United States also submitted a contribution to the CCIR's Interim Working Party 4/1 proposes the development of such a definition as well. The Department of Communications in Canada is working on a similar proposal for a portion of the 20/30 GHz band.

VII. Conclusion

Creating a General Satellite Service is consistent with the Commission's forward-looking thinking with regard to use of the electromagnetic spectrum. Such a generic service will best enable service providers, equipment manufacturers, users and the government to work together to meet the satellite communications needs of the future. Norris urges the Commission to proceed expeditiously to initiate a rulemaking proposing the reallocation of 20/30 GHz frequency bands to a General Satellite Service.

Respectfully submitted,

NORRIS SATELLITE COMMUNICATIONS, INC.

By: 
Leslie A. Taylor
Its Attorney

January 7, 1991

CERTIFICATE OF SERVICE

I, Andrew Taylor, hereby certify that I have on this 7th day of January, 1991 caused to be sent copies of the foregoing "Reply Comments of Norris Satellite Communications, Inc." by U.S. mail, postage prepaid, to the following:

A handwritten signature in black ink, appearing to read 'AT', is written over a horizontal line.

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